Catalog Description: MECH 320: Mechanics of Materials. Credit 3.
A course that addresses the mechanical behavior of materials under different loadings such as axial, bending, transverse shear, torsion, and combined loadings. Stress and strain transformation is discussed. Deflection of beams and buckling of columns are covered.
Prerequisite: CIVE 210.

Textbook

Goals
This course will cover the axial, torsion, bending and shear stresses, their combinations and stress transformations. The deflection of beams and buckling of columns will also be discussed.

Coordinator: Najib Kasti, Ph.D.
Room 202, SRB
Office Hours: M,W 11-12

Topics
1. Review: Statics (1 week)
2. Stress and Strain (1 week)
3. Mechanical Properties (1 week)
4. Deformation/Stress under Axial Load (1 week)
5. Torsional Deformation/Stress (1 week)
6. Bending Deformation/Stress (2 weeks)
7. Transverse Shear Deformation/Stress (2 weeks)
8. Combined Loadings (1 week)
9. Stress Transformation (1 week)
10. Deflection of Beams and Shafts (1 week)
11. Energy Methods (1 week)
12. Buckling (1 week)

Course Objectives
Upon completion of this course, the student will:
1. Determine the forces and moments on load carrying members by applying the principles of statics.
2. Determine the state of stress due to axial, bearing and shear forces, as well as torsional and bending moments.
3. Analyze the combined state of stress due to several loadings such as axial and shear forces, as well as torsional and bending moments.
4. Perform stress transformation to determine the principal normal stresses and maximum shear stress at a point.
5. Determine the deflection of shafts and beams.
6. Perform basic analysis and sizing of different structural members.

Assessment: (date subject to change)
- Assignments + Attendance 10%
- Drop Quizzes 20%
- Midterm (Wednesday March 28, 2012, 6-8pm) 25%
- Final 35%
- Project 10%